

Work Statement

Renewable Energy Transmission Initiative, Phase 1: Identification and Ranking of Competitive Renewable Energy Zones (CREZs)

PART A: Development of Methodology and Resource Screening

BACKGROUND

Background and Purpose

California has adopted energy policies that require substantial increases in the generation of electricity from renewable energy resources. Implementation of these policies will require extensive improvements to California's electric transmission infrastructure. The Renewable Energy Transmission Initiative (RETI) is a statewide planning process to identify the transmission projects needed to accommodate these renewable energy goals.

Phase 1 of the RETI involves a thorough assessment of the renewable resources in California and adjoining states, resulting in the identification of those areas, called Competitive Renewable Energy Zones (CREZs), that hold the greatest potential for cost-effective renewable development. These CREZs will then be ranked by their cost-effectiveness, based on the supply curves of renewable resources and transmission costs to access each CREZ. To the greatest extent possible and practical, this work will rely on the large body of work that has already been performed to assess renewable energy development potential in California and surrounding areas. RETI Phase 1 will bring together many previously discrete pieces of information to develop a clear picture of a California renewable development pathway, vetted by a public stakeholder process.

The scope of work for Phase 1 has been split into two parts. Part A includes:

- Literature review
- Development of base study assumptions
- Development of approach to resource valuation, transmission cost assessment, and other concepts
- High-level technology/resource assessment by geographic region
- Screening to identify most viable technology/resources and broad regions for development (e.g., geothermal in northwestern Nevada)
- Part A Report

Part A will be completed first so that a focused and more efficient approach can be taken for Part B.

Part B will include:

- Project identification and characterization
- Assessment of project and transmission costs
- Development of supply curves
- Integration modeling
- CREZ identification
- Part B Report preparation

This Work Statement covers Part A of the process.

Goals and Objectives of the Work Authorization

The goal of RETI Phase 1 is to identify the most cost-effective renewable resources in California and neighboring regions. The objectives for Part A will include:

- Identification of data sources and supporting literature
- Documentation of proposed base study assumptions (load growth, technology characteristics, transmission cost metrics, tax incentives, etc.)
- Documentation of proposed methodology for calculating cost of generation, resource valuation, transmission cost assessment, and other key concepts
- Identification of the most promising technology/resource categories to develop in California and neighboring regions (for example: northwest Nevada geothermal, Northern California wave energy, British Columbia hydro)

The most promising technology/resource categories will be carried forward for evaluation in Part B (not included in this Work Statement). Part B will encompass a project-level assessment of developable renewable resources, estimating both the generation and transmission costs of accessing and delivering the generation from planned and potential projects to load centers in California. These projects will then be grouped into Competitive Renewable Energy Zones (CREZs), based on, among other factors, geography, shared transmission constraints, development horizons and complementary generation profiles. The final output of RETI Phase 1 will be a ranking of cost-effective, priority CREZs. These CREZs will move on to Phase 2, the development of conceptual transmission plans (Phase 2 is outside the scope of this Work Statement).

TECHNICAL SCOPE OF WORK

TASK 1: Review Existing Relevant Reports and Other Ongoing Analyses

The Performing Institution shall:

- A. Review existing relevant reports and other ongoing analyses
- B. Maintain active list of ongoing reports and reference material to include in final document

Deliverables and Due Dates:

- List of existing relevant reports and ongoing analyses, to be included in Part A Report.
Due date: January 22, 2008

TASK 2: Document Proposed Study Assumptions

The Performing Institution shall:

- A. Review relevant information from literature and other ongoing analyses to identify appropriate study assumptions
- B. Develop list of common study assumptions, including, but not limited to:
 1. Financial assumptions for use in modeling including:
 - (1) Ownership structure (IOU ownership, PPA, etc.)
 - (2) Inflation

- (3) Debt to equity ratio
 - (4) Debt interest rate
 - (5) Equity return rate
 - (6) Debt term
 - (7) Tax rate
 - (8) Project economic life
 - (9) Discount rate
- 2. Renewable energy incentives
 - (1) Federal production tax credit
 - (2) Federal investment tax credit
 - (3) Federal accelerated depreciations
 - (4) Substantive state-level incentives
- 3. Renewable energy demand
 - (1) California electricity load forecast
 - (2) California-driven RPS demand
 - (3) Flexible compliance mechanisms
 - (4) Treatment of pre-existing and planned renewable energy projects
- 4. Transmission
 - (1) Available transmission capability
 - (2) Interconnection substation costs
 - (3) Transmission spur line costs
 - (4) Transmission service costs
- 5. Economic assumptions to support resource valuation (see Task 3)
- 6. Renewable technology-specific assumptions (see Task 4)

Deliverables and Due Dates:

- Documentation of study assumptions including justification. Included in Part A Report.
Due date: March 14, 2008

TASK 3: Development of Evaluation Methodologies

The Performing Institution shall:

- A. Identify key study methodological issues
- B. Assist in development of methodology for the following issues:
 - 1. Resource assessment
 - 2. Treatment of existing contracts, short-listed contracts and transmission queue
 - 3. Project identification, characterization and screening
 - 4. Technology developoment
 - 5. Resource valuation

- (1) Busbar cost of energy
- (2) Transmission cost
- (3) Integration cost
- (4) Capacity valuation
- (5) Energy valuation
6. Supply curve creation
7. CREZ identification, characterization and economic ranking (CREZ selection to be performed by others)

Deliverables and Due Dates:

- Documentation of study methodology including justification. Included in Part A Report.
Due date: March 14, 2008

TASK 4: Renewable Resource / Technology Assessment

The Performing Institution shall:

- A. Perform a high level assessment of promising renewable resources in California and adjoining regions in the WECC (Arizona, Nevada, Oregon, Washington, British Columbia, northern Baja California). The assessment will be based on readily available information sources. The assessment will not include customer-sited generation (i.e., “behind-the-meter” applications). The following renewables will be covered:
 1. Landfill Gas
 2. Digester Gas (including direct injection into natural gas pipelines)
 3. Solid Biomass
 4. Solar Photovoltaic
 5. Solar Thermal
 6. Hydropower
 7. Onshore Wind
 8. Offshore Wind
 9. Geothermal
 10. Wave Energy
 11. Marine Current
- B. Broadly characterize renewable energy technologies
 1. General description
 2. Commercial / developmental status
 3. Efficiency (if applicable)
 4. Capacity factor
 5. Typical size(s)
 6. Applicable current incentives (e.g., federal production tax credit)

7. Capital cost
 8. Operating and maintenance costs
 9. Typical fuel costs (if applicable)
 10. Typical development and construction schedule length (years)
 11. General levelized cost of energy ranges
- C. Forecast improvements in technology characteristics through 2020
1. Capital cost
 2. Operating and maintenance costs
 3. Efficiency
 4. Capacity factor
 5. Levelized cost of energy
- D. Identify most promising technologies/resources for supply of electricity to California
1. Commercially available by 2020
 2. Most economical over the study timeframe
 3. Resources with greatest potential

Deliverables and Due Dates:

- Part A Report including recommendations for most promising technology/resource categories to develop in California and neighboring regions (for example: northwest Nevada geothermal, Northern California wave energy, British Columbia hydro)

Due date: March 14, 2008

TASK 5: Stakeholder Engagement and Outreach

The Performing Institution shall:

The Performing Institution will work closely with, and be largely directed by, the Stakeholder Steering Committee (SSC). The SSC will meet monthly, and the consultant will report at each meeting as to its work in the past month, soliciting feedback on the analysis completed and advice as to next steps. During the course of Part A, participation in two SSC committee meetings is expected:

- January 22 (Sacramento) – Present resource assessment methodology, including supply curve development (not CREZ identification) and method for benchmarking cost curves against existing contracts, short-listed contracts and transmission queue to ensure that theoretical potential is not double counted.
- February 27 (San Francisco) – Present preliminary high-level resource assessment of theoretical/tech potential; preliminary identification of non-viable resources proposed to be removed from assessment; present general study assumptions (technology capital cost, O&M cost, financing assumptions, future cost and performance, etc.); present approach to resource valuation and forecasting technology development.

- March 26 (Sacramento) – Present and discuss results of Part A Report (to be issued March 14), highlighting any changes from the preliminary results presented February 27. Discuss approach to project identification, characterization and screening; supply curve creation; and CREZ identification and characterization.

Deliverables and Due Dates:

- Preparation of materials, attendance and participation in workshops (dates subject to scheduling changes).

TASK 6: Project Management and Coordination

The Performing Institution shall:

The Performing Institution shall act as Project Manager for Phase 1 of RETI. Responsibilities as Project Manager will include:

- Working with the RETI Stakeholder Steering Committee, CIEE and the CPUC to determine the content, form, and schedule for the stakeholder input that will allow the Performing Institution to complete the tasks outlined in this Work Statement.
- Working with the Center for Energy Efficiency and Renewable Technologies (CEERT) – the RETI Project Facilitator – to ensure that input from SSC is timely and thorough.
- Participating, as needed, in SSC working group meetings to obtain stakeholder input on specific issues.
- Reporting immediately to the SSC and the RETI Coordinating Committee any real or anticipated delays in stakeholder input or completion of tasks outlined in this Work Statement.
- Alerting CIEE and CPUC immediately if schedule of deliverables must be adjusted in order to meet Phase 1 final completion deadline of August 2008.